



Have I Learnt Python?

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Jean Golding Institute
31st July 2026





R you serious?

Earth Sciences MSci
University of Oxford



Research Scientist
Museum Für Naturkunde, Berlin



PhD in Evolutionary Biology
University of Bath & University of Tasmania



Research Associate
The Alan Turing Institute & Imperial



Data Scientist
EcoVeritas



Principal Modelling Analyst & Simulation Modelling Specialist



Senior Consultant & Senior Decision Scientist
AtkinsRéalis



Data Scientist
JGI, University of Bristol





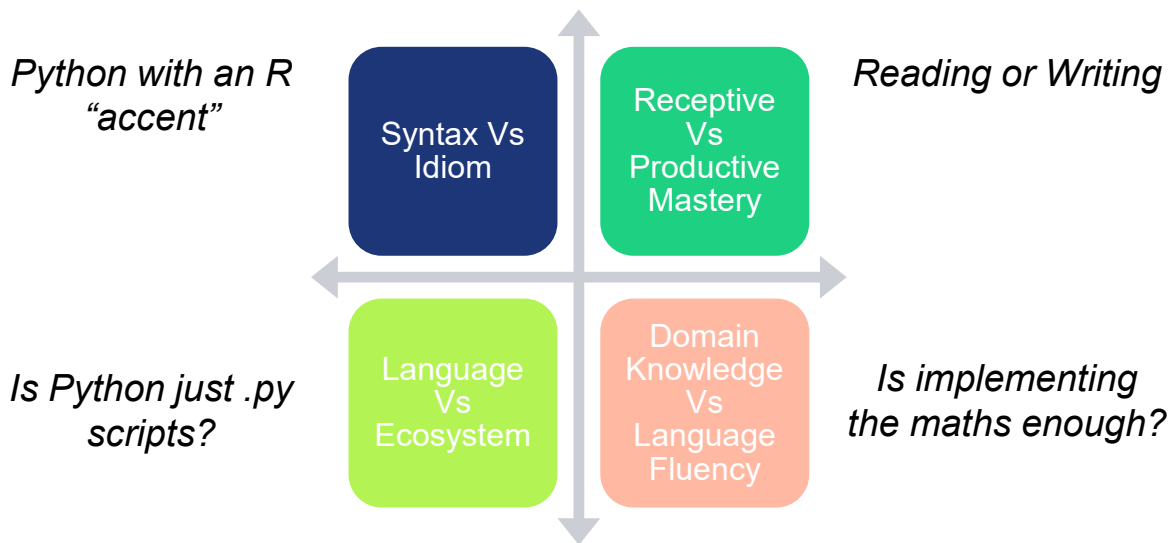
Description: English. Booklet version of the *Things Fall Apart* Language Toolkit 18 p. pp. 181-189. Includes materials to assist in identifying, evaluating, and using various kinds of news stories.

Case 25 June 2016

Source: [West coast](#)

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What does it mean to learn a language?





A Quick Sidebar

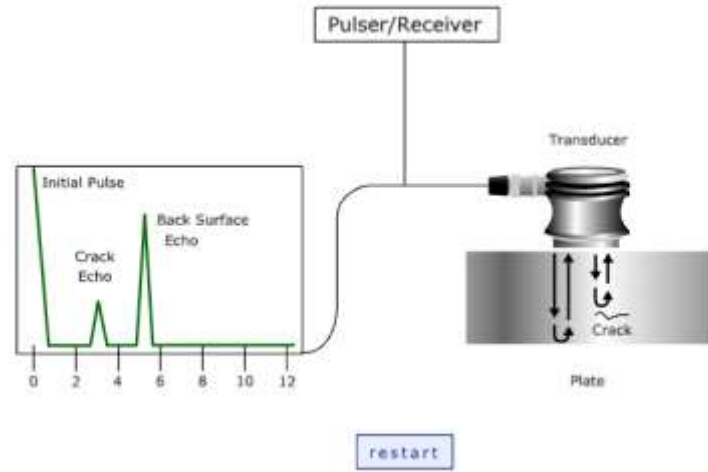
*A Statistical Toolkit for Reliability Assessments
in Non-Destructive Testing*

Aim: Develop a python package and application to support Engineers with reliability assessments.

Ultrasonics & NDT

Non-Destructive Testing (NDT) is like medical imaging for industrial machines.

Instead of using X-rays on a human body, engineers use high-frequency sound waves (ultrasound) to "see" inside safety-critical components like airplane wings, nuclear reactor pipelines, or bridges without damaging them.

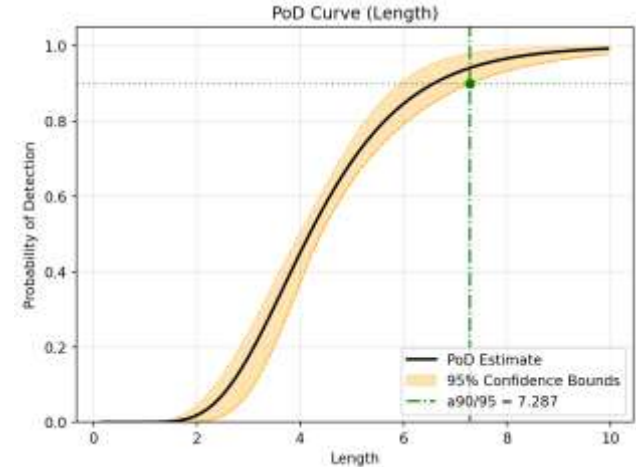


[Ultrasonics Example](#)

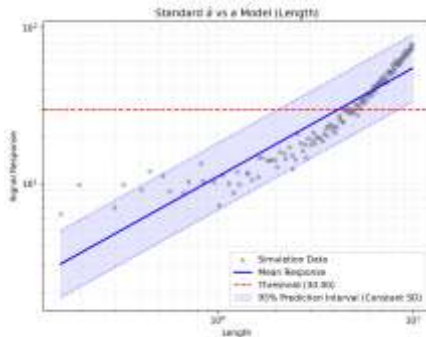
Reliability

Reliability is the difference between catching a microscopic crack before it causes a catastrophic disaster or missing it completely.

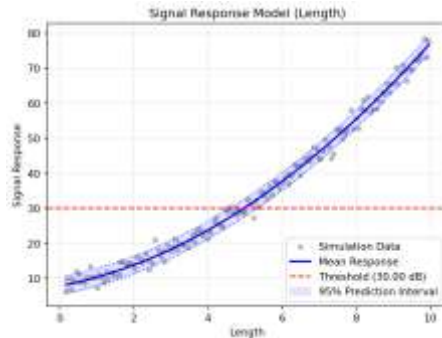
- **The stakes are high:** If an inspection method isn't reliable, a tiny hidden defect can grow under stress, leading to structural failures.
- **The metric of trust:** In engineering, we measure this trust using a **Probability of Detection (PoD) curve**. It tells us exactly how confident we are in finding a crack of a specific size.



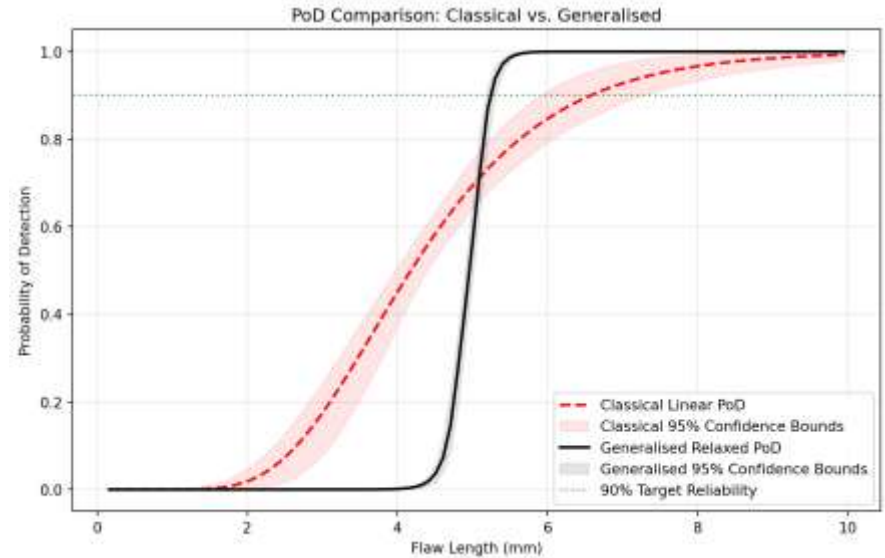
How can improve reliability?



Classical



Generalised





Back to RSE...

*A Statistical Toolkit for Reliability Assessments
in Non-Destructive Testing*

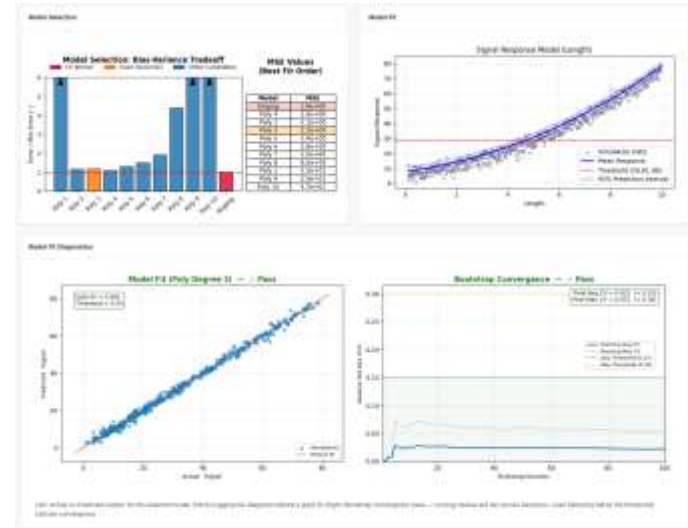
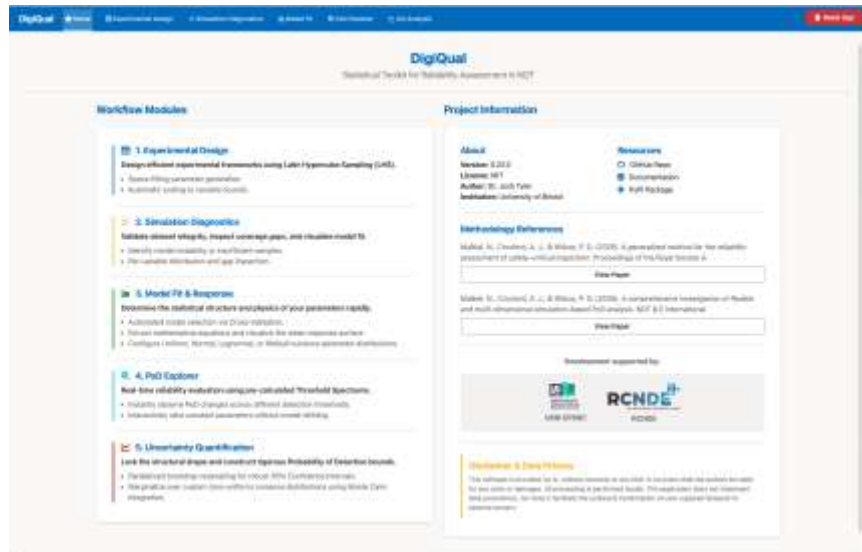
Aim: Develop a python package and
application to support Engineers with
reliability assessments.

digiqua

A Statistical Toolkit for Reliability Assessments in Non-Destructive Evaluation

JGI collaboration: 1 year at 50% FTE

JGI contribution: Software development
Product design
Stakeholder engagement



Documentation: jgibristol.github.io/digiqua
Package: pypi.org/project/digiqua

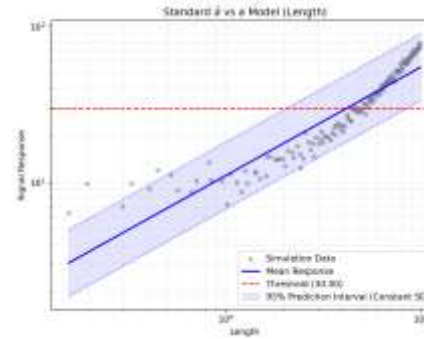
Step 1: Understand the Maths

Linear fits → Complex polynomials

Gaussian Error → Different Distributions

Constant Error → Changing Standard Deviation

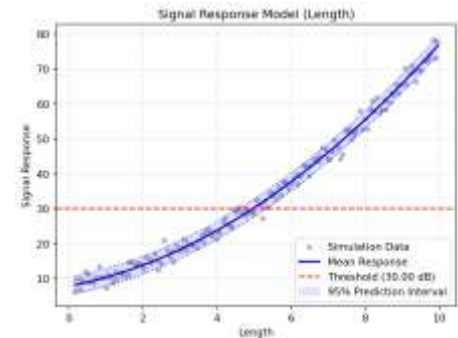
Input Data → Plots & Tables



Classical



Generalised



Nothing inherently Pythonic about this...

Step 2: Build A Package

- Can I use a cheat-sheet? ([pythoncheatsheet](https://pythoncheatsheet.com/))
- Can I follow a web guide? (<https://packaging.python.org/>)
- Can I write a function? (See a decade of R, plus some Gemini)
- Can I write a test? ([Pytest](https://docs.pytest.org/en/latest/))

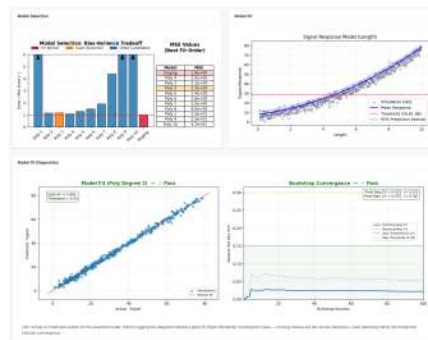
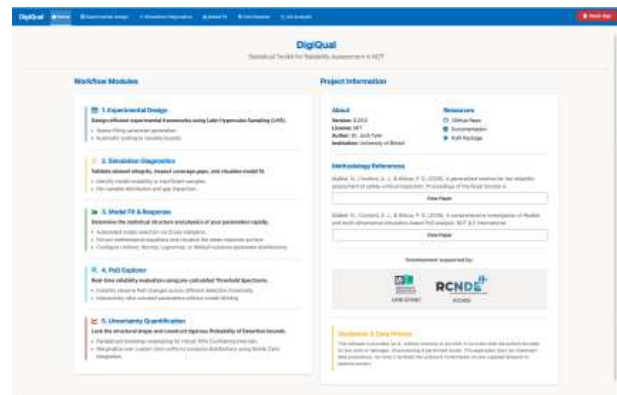
Not exclusively Pythonic things...





Step 3: Build A UI

- Lots of different ways to build GUIs
 - [Streamlit](#)
 - [PyQt](#)
 - [Tkinter](#)
 - [Flet](#)
- I've used [Shiny for R](#) for a decade, why not just use [Shiny for Python](#)?



Shiny works with R or Python...

Step 4: Build the Documentation



It's just a lot of markdown & html with some simple python code blocks!



Documentation: jgibristol.github.io/digiqua!

Quarto works with lots of coding languages...

Step 5: Reflect

- AI & LLMs allow for rapid generation and translation of code between popular languages
- Huge overlap in methods and tools in R and Python
- Very easy to miss the nuances of different languages



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Demo

Digiqua
*A Statistical Toolkit for Reliability Assessments
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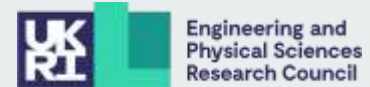


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Thanks to Dr. Paul Wilcox
(Electrical, Electronic and
Mechanical Engineering)



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Package: pypi.org/project/digiqua1